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NIST

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UNIFORM LAWS AND REGULATIONS

in the area of legal metrology and engine fuel quality

NIST Handbook 130

2004

237-5 D E diesel

Source: Central Weights and Measures Association (CWMA)

Recommendation: To request that E diesel be added to the agenda of the Committee as a "Developing Item".

Justification:

(a) There is currently no consensus specification for E diesel, and a specification may need to be developed at a later date.
(b) It may become necessary to develop "retail" labeling guidelines for E diesel.
(c) If development of specification and labeling guidelines need to be developed, it may become necessary to assign this effort to the Petroleum Subcommittee or a specially selected Task Group.

Background: E diesel is a blend of Standard Number 2 diesel fuel containing up to 15 percent ethanol by volume. The blend also contains 0.2 to 5.0 percent by volume proprietary additives to maintain certain fuel properties and blend stability. Currently E diesel does not have to conform to any specification designating properties.

E diesel is being sold commercially for off-road applications and is being used in several on-road demonstration fleets. A group of E diesel stakeholders have formed the E diesel consortium to address the technical and regulatory issues with this fuel.

The Consortium has also approached ASTM about developing an E diesel specification.

At the CWMA Interim Meeting in September 2002, E diesel Consortium representative Robert Reynolds provided an update on the activities of the E diesel Consortium and requested that E diesel be put on the Committee agenda as a "Developing Item."

237-6 V Nozzle Requirements for Diesel Fuel

Source: Central Weights and Measures Association (CWMA)

Background: Consumers are dispensing diesel fuel into non-diesel vehicles despite the proper labeling of retail motor fuel dispensers. The Committee feels that the following recommendation will help eliminate the problem.

Recommendation: Amend NIST Handbook 130, Uniform Engine Fuels, Petroleum Products, and Automotive Lubricants Regulation, Section 3. Diesel Fuel, as follows:

3.3 Diesel Fuel

3.3.X. Nozzle Requirements for Diesel Fuel. -- Each dispensing device from which diesel fuel is sold shall be equipped with a nozzle spout having a terminal end with an outside diameter of not less than 23.63 mm (0.930 in).

237-7 V Premium Diesel, Single Definition

Source: Southern Weights and Measures Association (SWMA)

Background: SWMA proposed a change to the EFR by deleting the energy content and fuel injector cleanliness requirement.

Justification for changes:

A single definition for premium diesel is imperative for this rule to gain acceptance by states. NCWM passed this definition under the assurance that the Working Group (WG) would continue to monitor and work toward a better solution. The SWMA believes that action must be taken based on ASTM activities, recently reviewed survey data, and work group discussions that have included engine manufacturing representatives.

Thermal Stability – Engine manufacturers have expressed that a standard of 80 percent should provide an adequate fuel. There was no recommended change to this value from the premium diesel work group. Data reviewed indicates this value should be achievable in most cases.

Energy Content – Fungible issues continue to exist. Engine manufacturer representatives have indicated that removing the requirement would be satisfactory.

Fuel Injector Cleanliness, along with the cafeteria approach, has been a very controversial component of this definition. The working group commitment to monitor the progress of L 10 as an ASTM test method is to report officially to the NCWM that the ASTM effort to pass this method has failed and the ASTM L 10 Surveillance Panel has dissolved. Even without the cost factor, the test can no longer be run. If a laboratory were to offer the test and a failure was cited, it is likely that the cited party would be able to successfully contest the results from a test. Unfortunately, the detergency criteria, which may well provide a benefit to the end user, can no longer be used.

Recommendation: Amend NIST Handbook 130, Uniform Engine Fuels, Petroleum Products, and Automotive Lubricants Regulation, Section 2 Standard Fuel Specifications, Subsection 2.2.1. Premium Diesel Fuel, as follows:

Add to Definitions:

1.XX Lubricity. – a qualitative term describing the ability of a fluid to affect friction between, and wear to, surfaces in relative motion under load.

Delete from the current Definitions:

~~**1.17. Energy Content. m**eans the gross energy content of the heating value of diesel fuel as defined by its heat of combustion; the heat released when a known quantity of fuel is burned completely under specific conditions as determined by ASTM Standard Test Method D240.~~

~~**1.21. Fuel Injector Cleanliness.** means a characteristic of the fuel which allows engine operation without fuel contribution to excessive injector deposits. (Added 1998)(Amended 1999)~~

Amend the following:

2.21. Premium Diesel Fuel – ~~Effective January 1, 2000, a~~ All products identified on retail dispensers, bills of lading, invoices, shipping papers, or other documentation with terms such as premium, super, supreme, plus or premier must conform to ~~at least two of~~ the following requirements:

~~**(a) Energy Content** – A minimum energy content of 38.65 MJ/L, gross (138 700 BTU/gallon, gross) as measured by ASTM Standard Test Method D 240.~~

~~(b)~~ **(a.) Cetane Number -** A minimum cetane number of 47.0 as determined by ASTM Standard Test Method D 613.

~~(c)~~ (**b.) Low Temperature Operability -** A cold flow performance measurement which meets the ASTM D 975 tenth percentile minimum ambient air temperature charts and maps by either ASTM Standard Test Method D 2500 (Cloud Point) or ASTM Standard Test Method D 4539 (Low Temperature Flow Test, LTFT). Low temperature operability is only applicable October 1 - March 31 of each year.

~~(d)~~ **(c.) Thermal Stability -** A minimum reflectance measurement of 80 percent **as determined by ASTM Standard Test Method D 6468** ~~using a green filter in the Octel America's Test Method No. F21-61~~ (180 min, 150 °C).

(d.) Lubricity – A minimum load of 3100 grams as determined by ASTM D 6078, If an enforcement jurisdiction's single test of less than 2600 grams is determined, a second test shall be conducted. If the average of the two tests are less than 2600 grams, the sample does not conform to the requirements of this part.

~~**(e) Fuel Injector Cleanliness** – A Coordinating Research Council (CRC) rating of 10.0 or less and a flow loss of 6.0 percent or less as determined by the Cummins L-10 Injector Depositing Test.~~

~~1. When a fuel uses a detergent additive to meet the requirement, upon the request of the Director, the fuel marketer shall provide test data indicating the additive being used has passed the Cummins L-10 Injector Depositing Test requirements when combined with Caterpillar 1-K (CAT 1-K) reference fuel. The Director may also request records or otherwise audit the amount of additive being used to ensure proper treatment of fuels according to the additive manufacturer's recommended treat rates.~~

~~1.1. Upon the request of the Director, the fuel marketer shall provide an official "Certificate of Analysis" of the physical properties of the additive.~~

~~1.2. Upon the request of the Director, the fuel supplier shall provide a sample of detergent additive in an amount sufficient to be tested with CAT 1-K reference fuel in a Cummins L-10 Injector Depositing Test. The regulatory agency requesting the sample shall be responsible for all costs of testing.~~

~~2. When a fuel marketer relies on the inherent cleanliness of the diesel fuel to pass the Cummins L-10 Injector Depositing Test or if the fuel requires a lower detergent additive level than the amount required when the additive is used with the CAT 1-K reference fuel, the fuel marketer shall provide, upon the request of the Director, annual test results from an independent laboratory that confirms the fuel meets the requirements of 2.2.1. (e). The time of fuel sampling and testing shall be at the Directors discretion. The Director may witness the sampling of the fuel and the sealing of the sample container(s) with security seals. The Director may request confirmation from the testing laboratory that the seals were intact upon receipt by the laboratory. The final test results shall be provided to the Director. All costs for sampling, transporting, and testing shall be the responsibility of the fuel supplier. If the annual test complies, any additional testing at the request of the Director shall be paid for by the regulatory agency. (Added 1998) (Amended 1999)~~

~~**3.3.3. Labeling Properties of Premium Diesel** – All retail dispensers identified, as premium diesel must display either:~~

~~1. A label that includes all qualifying parameters as specified in 2.2.1. Premium Diesel Fuel affixed to each retail dispenser. The label shall include a series of check blocks clearly associated with each parameter. The boxes for the parameters qualifying the fuel must be checked. All other boxes shall remain unchecked. The marketer may check as many blocks as apply, or,~~

~~2. A label that includes only the parameters selected by a marketer to meet the premium diesel requirements as specified in 2.2.1. Premium Diesel Fuel. In either case, the label must display the following words:~~

~~"Premium Diesel Fuel" in a type at least 12 millimeters (2 inches) in height by 1.4 millimeters (1/16 inch) stroke (width of type.)~~

~~When applicable, as determined by the label option and qualifying parameters chosen by the marketer, the label must also display the following information and letter type size:~~

~~The words "Energy Content," "Cetane Number," "Low Temperature Operability," "Thermal Stability," and "Fuel Injector Cleanliness" in a type at least 6 millimeters (1/4 inch) in height by 0.75 millimeter (1/32 inch) stroke (width of type.)~~

~~A declaration of the minimum Energy Content (minimum 38.65 MJ/ L gross [138,700 BTU/gallon]), if energy content is chosen as a qualifying parameter, in type at least 3 millimeters (1/8 inch) in height by 0.4 millimeter (1/64 inch) stroke (width of type.)~~

~~The minimum cetane number guaranteed (at least 47.0) if cetane number is chosen as a qualifying parameter, in a type at least 3 millimeters (1/8 inch) in height by 0.4 millimeter (1/64 inch) stroke (width of type.)~~

~~The date range of low temperature operability enhancement, (e.g., October - March,) along with the qualifying test method (ASTM D 4539 or ASTM D 2500), if low temperature operability is chosen as a qualifying parameter, in a type at least 3 millimeters (1/8 inch) in height by 0.4 millimeter (1/64 inch) stroke (width of type).~~

~~For Example:~~

~~**Premium Diesel Fuel**~~

~~High Energy Content~~
~~Cetane Number, 47.0 min~~
~~Low Temperature Operability (Oct. Mar.,LTFT)~~
~~Thermal Stability~~
~~Fuel Injector Cleanliness~~

~~or~~

~~**Premium Diesel Fuel**~~

~~Cetane Number, 47.0 min~~
~~Low Temperature Operability (Oct.-Mar., LTFT)~~
~~Thermal Stability~~

~~The label must be conspicuously displayed on the upper half of the product dispenser front panel in a position that is clear and conspicuous from the driver's position.~~
~~(Added 1998) (Amended 1999)~~

7.1.1. Premium Diesel -The following test methods shall be used to determine compliance with the ~~applicable~~ premium diesel parameters:

~~(a) Energy Content - ASTM D 240~~

~~(b)~~ **(a.)**Cetane Number - ASTM D 613

~~(c)~~ **(b.)** Low Temperature Operability - ASTM D 4539 or ASTM D 2500 (according to marketing claim)

~~(d)~~ **(c.)** Thermal Stability - ~~Octel America F21-61 (180 min, 150 EC)~~ ASTM D 6468 (180 min., 150°C).

(d) Lubricity – ASTM D 6078

~~(e) *Fuel Injector Cleanliness - The most recent edition of the Cummins L-10 Injector Depositing Test as endorsed by the ASTM L-10 Injector Depositing Test Surveillance Panel.~~

~~* Upon ASTM approval of a standard test methods that are is derived from the above referenced methods, the ASTM standard test methods shall be used to determine compliance with the applicable premium diesel parameter.~~
(Amended 1999, 2003)